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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MATTIS, JASON E	

ART UNIT	PAPER NUMBER
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,276	BRAJAL ET AL.	
	Examiner	Art Unit	
	JASON E. MATTIS	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *5/19/08*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Amendment filed 5/19/08. Due to the amendment, the previous rejections under 35 USC 112 second paragraph and 35 USC 101 have been withdrawn. New claims 11-15 have been added. Claims 1-15 are currently pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (U.S. Pat. 6373861 B1) in view of Wei et al. (U.S. Pat. 6714526 B2) and Roh (U.S. Publication US 2003/0185281 A1).

With respect to claims 1 and 5, Lee discloses a transmitter implementing a method for transmitting data using multi-carrier CDMA for accessing a transmission system **(See column 1 lines 33-39 and Figure 1 of Lee for reference to a transmitter 100 for transmitting data using a multi-carrier CDMA for accessing a multi-carrier CDMA system using an OFDM/CDMA technique)**. Lee also discloses a

modulator modulating the data to be transmitted using OFDM to produce OFDM modulated data symbols and a mixer spreading the OFDM modulated data symbols with spreading codes **(See column 1 line 40 to column 2 line 17 and Figure 1 of Lee for reference to both modulating transmission data using OFDM orthogonal codes and spreading the transmission data using CDMA PN spreading sequences)**. Lee does not specifically disclose the spreading codes including sequences predefined so that they satisfy predetermined auto-correlations and/or cross-correlations criteria within a region around a central point of an Interference-Free Window. Lee also does not specifically disclose the transmission channel including multi-paths with associated time lengths and a delay spread defined as a time length corresponding to an estimate of a difference between the time lengths of at least two different multi-paths with the length of the IFW depending on the channel delay spread.

With respect to claim 2, Lee discloses the transmission system comprising a transmitter, a receiver, and a transmission channel for transmitting the data from the transmitter to the receiver via the transmission channel **(See column 1 lines 33-39 and Figure 1 of Lee for reference to the system comprising a transmitter 100, a receiver 120, with the transmitter 100 and receiver 120 using both forwarding link and reverse line transmission channels for transmitting the data)**. Lee does not specifically the IFW depending on the channel delay spread.

With respect to claim 3, Lee does not disclose using sequences chosen such that their off-peak partial autocorrelation and partial cross-correlations values are zero within the IFW.

With respect to claim 4, Lee does not disclose the sequences comprising zero gaps.

With respect to claims 6 and 7, Lee discloses a receiver implementing a method for receiver data using multi-carrier CDMA for accessing a transmission system **(See column 1 lines 33-39 and Figure 1 of Lee for reference to a receiver 120 for receiving data using a multi-carrier CDMA for accessing a multi-carrier CDMA system using an OFDM/CDMA technique)**. Lee also discloses modulating the data to be transmitted using OFDM to produce OFDM modulated data symbols and spreading the OFDM modulated data symbols with spreading codes **(See column 1 line 40 to column 2 line 17 and Figure 1 of Lee for reference to both modulating transmission data using OFDM orthogonal codes and spreading the transmission data using CDMA PN spreading sequences)**. Lee further discloses demodulating the received data according to the transmission sequences used **(See column 2 lines 18-39 and Figure 1 of Lee for reference to receiver 120 demodulating received data according to the transmission sequences used)**. Lee does not specifically disclose the spreading codes including sequences predefined so that they satisfy predetermined auto-correlations and/or cross-correlations criteria within a region around a central point of an Interference-Free Window. Lee also does not specifically disclose the transmission channel including multi-paths with associated time lengths and a delay spread defined as a time length corresponding to an estimate of a difference between the time lengths of at least two different multi-paths with the length of the IFW depending on the channel delay spread.

With respect to claims 8 and 9, Lee does not disclose a computer program product implementing instructions to perform the method.

With respect to claim 10, Lee discloses a system comprising transmitter and receiver for transmitting data using multi-carrier CDMA for accessing a transmission system **(See column 1 lines 33-39 and Figure 1 of Lee for reference to a system including a transmitter 100 and receiver 120 for transmitting and receiving data using a multi-carrier CDMA for accessing a multi-carrier CDMA system using an OFDM/CDMA technique)**. Lee also discloses modulating the data to be transmitted using OFDM to produce OFDM modulated data symbols and spreading the OFDM modulated data symbols with spreading codes **(See column 1 line 40 to column 2 line 17 and Figure 1 of Lee for reference to both modulating transmission data using OFDM orthogonal codes and spreading the transmission data using CDMA PN spreading sequences)**. Lee does not specifically disclose the spreading codes including sequences predefined so that they satisfy predetermined auto-correlations and/or cross-correlations criteria within a region around a central point of an Interference-Free Window. Lee also does not specifically disclose the transmission channel including multi-paths with associated time lengths and a delay spread defined as a time length corresponding to an estimate of a difference between the time lengths of at least two different multi-paths with the length of the IFW depending on the channel delay spread.

With respect to claims 1-10, Wei et al., in the field of communications, discloses using spreading codes including sequences predefined so that their off-peak

partial autocorrelation and partial cross-correlations values are zero within an IFW **(See the abstract, column 3 line 32 to column 4 line 14, column 6 line 66 to column 7 line 40 of Wei et al. for reference to an LAS-CDMA system including LS codes, which are spreading codes, designed such their autocorrelations and cross-correlation values are zero within an Interference Free Window)**. Wei et al. also discloses a transmission channel including multi-paths with associated time lengths with the length of the IFW depending on the channel delay spread **(See column 9 lines 38-61 of Wei et al. for reference to selecting the IFW based on the multi-path propagation delay profile of a mobile user)**. Wei et al. further discloses the sequences comprising zero gaps **(See column 4 lines 45-60 and Figure 2 of Wei et al. for reference to using a variable size gap, which is a zero gap, with the LS code sequences)**. Using sequences as described by Wei et al. has the advantage of reducing interference.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Wei et al., to combine using sequences as described by Wei et al., with the system and method of Lee, with the motivation being to reduce interference.

With respect to claims 8 and 9, Wei et al. discloses implementing a transmission method using a computer program product performing instructions **(See column 10 lines 41-54 of Wei et al. for reference to elements of a transmission system and method using computer software instructions, which comprising a computer program product, to implement the method)**. Using a computer program

product performing instructions to implement a method has the advantage of allowing the method to implemented and adapted to a wide variety of communication devices using computer processors.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Wei et al., to combine using a computer program product performing instructions to implement a method, as described by Wei et al., with the system and method of Lee, with the motivation being to allow the method to implemented and adapted to a wide variety of communication devices using computer processors.

With respect to claim 1-10, although Wei et al. does disclose a transmission channel including multi-paths with associated time lengths with the length of the IFW depending on the channel delay spread **(See column 9 lines 38-61 of Wei et al. for reference to selecting the IFW based on the multi-path propagation delay profile of a mobile user)**, Wei et al. does not specifically disclose the length of an IFW being greater than a channel delay spread between two different multi-paths.

With respect to claims 1-10, Roh, in the field of communications, discloses selecting the length of an IFW to be greater than a channel delay spread between two different multi-paths **(See page 1 paragraphs 11-13 of Roh for reference to selecting an IFW size to be a size sufficient to remove a multi-path delay spread time period between two different multi-paths)**. Selecting the length of an IFW to be greater than a channel delay spread between two different multi-paths has the advantage of

removing the interference among spreading codes allocated to user **(See page 1 paragraph 13 of Roh for reference to this advantage)**.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Roh, to combine selecting length of an IFW to be greater than a channel delay spread between two different multi-paths, as suggested by Roh, with the system and method of Lee and Wei et al., with the motivation being to remove interference.

With respect to claims 11-15, Although Roh does disclose selecting an IFW length in accordance with multi-path delay offsets **(See page 1 paragraphs 11-13 of Roh for reference to selecting an IFW size to be a size sufficient to remove a multi-path delay spread time period between two different multi-paths)**, the combination of Lee, Wei et al., and Roh does not specifically the at least two different multi-paths including a longest path and a shortest path. Choosing the two different multi-paths to include a longest path and a shortest path would have been an obvious design choice at the time of the invention, since in order to remove all interference caused by multi-path propagation **(See page 1 paragraph 13 of Roh)**, the IFW must be at least as large as the difference between the longest path and shortest path. Choosing an IFW length based on multi-path delays including a longest path and a shortest path has the advantage of allowing an IFW to be used to effectively remove all interference caused by multi-path propagation.

Response to Arguments

4. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON E. MATTIS whose telephone number is (571)272-3154. The examiner can normally be reached on M-F 8AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on (571)272-6703. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JEM

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